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REMARKS

Claims 1-3 and 7-9 stand rejected under 35 U.S.C. § 103 as being unpatentable over Ohmori et al. '153 ("Ohmori") in view of Kudo et al. '434 ("Kudo") and Aguilar et al. '082, and claims 4-6 and 10-12 stand rejected under 35 U.S.C. § 103 as being unpatentable over Ohmori in view of Dickopp et al. '811 ("Dickopp") and Aguilar et al. '082. Claims 1, 4, 7 and 10 are independent. These rejections are respectfully traversed for the following reasons. Generally speaking, it is respectfully submitted that the Examiner has improperly interpreted several of the elements disclosed in the cited prior art with respect to the elements recited in the pending claims.

A. "voiced/voiceless judging means"

As a preliminary matter, the alleged voice/voiceless judging means (i.e., Affricate detecting unit 7) of Ohmori detects affricate or fricative sound from an autocorrelation of degree 10 obtained from the LPC analyzing filter 2 (see col. 7, lines 11 - 22). In contrast, according to one aspect of the present invention, the voice/voiceless judging means can detect a voice sound and a voiceless sound from a digital signal A/D converted from an analog narrow band signal.

Each of the independent claims embodies analyzing the voiced/voiceless sections of a digital signal. The Examiner relies on the Up-samplers 3 and 8 shown in Figure 1 of Ohmori as the claimed analog-to-digital converting means for converting an audio into a digital signal (also claimed in method format), and relies on the Affricate Detecting Unit 7 shown in Figure 1 of Ohmori as the claimed voiced/voiceless judging means for analyzing that signal (also claimed in method format). However, as shown in Figure 1, the Affricate Detecting Unit 7 does not receive digital signals from the alleged A/D converters 3,8 and therefore does NOT analyze those signals. Indeed, the Affricate Detecting Unit 7 merely operates to control the boost amount of the boosting circuit 10. It follows that, even assuming *arguendo* proper, the proposed modifications would not

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suggest other features of the claimed inventions because the Affricate Detecting Unit 7 is not designed nor intended to influence a filter which limits the band of an output signal from an aliasing signal generating means. As such, the secondary references at best would suggest incorporation of their respective elements into the device of Ohmori *independent* of the Affricate Detecting Unit 7, which would result in a device that is NOT suggestive of the claimed *combination* of elements and their *functional interrelationships*. For at least the aforementioned reasons, the pending rejections do not disclose each and every limitation set forth in the pending claims. Moreover, it is respectfully submitted that the cited prior art further does not disclose or suggest, *inter alia*, the following elements recited in one or more of the pending claims, let alone in the specific structural combination and functional interrelationship with the other claimed elements.

B. "analog-to-digital converting means"

The alleged analog-to-digital converting means of Ohmori (Up-samplers 3,8) merely operate to up-sample the sampling frequency from 8kHz to 16kHz and to up-sample the LPC (Linear Predictive Coding) residual and generate aliasing distortion, respectively (see col. 4, lines 15-16 and col. 5, lines 43-47). In short, the Up-samplers 3, 8 function merely to up-sample sampling frequencies but do not conduct analog-to digital conversion.

C. "aliasing signal generating means"

The Examiner merely refers to col. 5, line 42 – col. 6, line 22 of Kudo as allegedly disclosing the claimed aliasing signal generating means without identifying where Kudo describes the claimed function. Nonetheless, it is submitted that the relied on portions of Kudo do not disclose or suggest the claimed aliasing signal generating means. Turning to Kudo, up-sampler 205 conducts the processing of inserting 0 (zero) in sample positions of the baseband signal X' (n Δ T) thinned out by the downsample 109 of the transmitting side (see col. 5, lines 51-55). Herein, the

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baseband signal $X'(n \Delta T)$ is a prediction residual signal. In contrast, according to the aliasing signal generating means of the present invention, a digital signal A/D converted from the analog narrow band signal at the sampling points can be replaced with zero value.

D. "frequency spectrum folding means"

The Examiner relies on Dickopp as allegedly disclosing this element but does not appear to identify where Dickopp allegedly discloses the claimed functionality. In this regard, when imposing a rejection under 35 U.S.C. §103, the Examiner is required to point to "page and line" wherein an applied reference is perceived to identically disclose each feature of a claimed invention. *In re Rijckaert*, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993); *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481 (Fed. Cir. 1984).

Indeed, Dickopp merely discloses a method for optimizing the analysis window function and synthesis window function using longer time overlapping regions of every two subsequent time units, so that in the receiving side audio signals synthesized are smooth even in the overlapping regions. To achieve this, Dickopp uses time shift of signals in the overlapping region as shown in Figs. 2-16 and the explanations thereof. However, Dickopp fails to disclose or suggest the claimed functionality of "inverting the polarity of sampled signals on every relevant order of sample point of digital signals issued from said analog-to-digital converting means" embodied by claim 4.

E. Summary

As described above, the cited prior art does not disclose or suggest the claimed features of the present invention, let alone the respective functional relationships therebetween. Indeed, these differences exemplify a greater difference between the present invention and cited prior art. Ohmori is directed to processing an LPC residual signal and autocorrelation in the audio signal; whereas a digital signal itself A/D converted from the audio signal can be processed in the present invention.

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In this regard, Ohmori uses code-mapping, e.g., CELP (Code Excited Linear Prediction) which uses a residual signal. It follows that the system of Ohmori needs the narrow band code book 6 and the wide band code book 12, both of which need to be previously prepared and stored as code vectors (see col. 4, lines 44-64). Accordingly, two series of processing have to work in parallel as shown in Figure 1 of Ohmori (elements 2, 8, 9, 7, 10 to 11 being one series and elements 6, 12, 13 to 11 being the other).

In contrast, according to the present invention, the code mapping system technology such as CELP is not needed, and the narrowband signal can be extended in a frequency range by processing a digital signal such as a PCM signal A/D converted from the narrowband analog signal. Accordingly, turning to the exemplary embodiment shown in Fig. 1 of Applicants' drawings, one series of processing can be used. The amount of calculations can therefore be made smaller than that needed in Ohmori. Moreover, as the code-mapping is not needed in the present invention, the calculation for the matching process is not necessary so that, as explained on page 4, lines 12-15 of Applicants' specification, the present invention is capable of compensating the audio frequency range practically in relatively small operation steps and is capable of improving the sound quality and the listening comprehension of words. In addition, the present invention can provide the capability to eliminate the need for a memory storing a code book.

The Examiner is directed to MPEP § 2143.03 under the section entitled "All Claim Limitations Must Be Taught or Suggested", which sets forth the applicable standard:

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (citing *In re Royka*, 180 USPQ 580 (CCPA 1974)).

In the instant case, the pending rejections do not "establish *prima facie* obviousness of [the] claimed invention" as recited in claims 1, 4, 7 and 10 because the proposed combinations fail the "all the claim limitations" standard required under § 103.

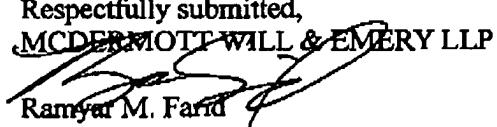
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Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claims 1, 4, 7 and 10 are patentable for the reasons set forth above, it is respectfully submitted that all claims dependent thereon are also patentable. In addition, it is respectfully submitted that the dependent claims are patentable based on their own merits by adding novel and non-obvious features to the combination.

Based on the foregoing, it is respectfully submitted that all pending claims are patentable over the cited prior art. Accordingly, it is respectfully requested that the rejections under 35 U.S.C. § 103 be withdrawn.

CONCLUSION

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication for which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below. To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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